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ABSTRACT

Ways that data from four major longitudinal surveys can be used in postsecondary education policy analysis are discussed: the National Longitudinal Survey of Labor Market Experience (NLS-LM), Project TALENT, the Panel Study of Income Dynamics (PSID), and the National Longitudinal Study of the High School Class of 1972 (NLS-HS). The potential use of NLS-LM, TALENT, and PSID as alternatives for or complements to NLS-HS is also addressed. After describing the data collected by each survey, attention is directed to the possible relevance of the survey to research tracing the progress of youths after high school. The surveys are compared concerning information content, sample sizes, sampling, and the problem of data obsolescence. It is suggested that researchers have ignored much of the policy-relevant information available in these four databases by relying chiefly on static analysis and a fairly narrow range of topics: who goes to college or what kind of college, occupational/earnings outcomes, and factors affecting educational attainment. Ways of expanding the scope of research and analysis are suggested. Technical features and peculiarities of content that are likely to affect the use of the surveys for policy research are also identified. (SW)

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COMMENTS ON POSSIBLE POLICY RESEARCH USES OF FOUR MAJOR LONGITUDINAL DATA BASES

By

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EPRC for Higher Education and Society

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ABSTRACT

This report was prepared in response to a request for comments on three major longitudinal surveys covering the postsecondary education and work experience of youths. It summarizes some features of these surveys which affect their potential use as alternatives for or complements to the National Longitudinal Study of the High School Class of 1972 (now in progress), which was the subject of a previous report.

The three alternative surveys considered are the National Longitudinal Survey of Labor Market Experience, Project TALENT, and the Panel Study of Income Dynamics.

The report focuses on those features of the surveys which bear on policy-oriented research concerning the progress of youths in the years following completion of high school. Each of the three "alternate" surveys is compared with the National Longitudinal Survey (High School) and with the other alternates.

No item-by-item comparison of the surveys has been attempted. Instead, a qualitative, and sometimes impressionistic, description of the data bases is presented and discussed in connection with policy-related questions. It is possible that researchers with other goals could have evaluated the surveys in a different fashion.

After review of the contents, methods, and technical success of each of these surveys, I rank them, according to overall policy potential, as follows:

1. National Longitudinal Surveys of Labor Market Experience (male and female youth cohorts)--a very good general data source, though aging.

2. National Longitudinal Study of the High School Class of 1972--a good data source for some uses, with high but as yet unrealized potential and some important technical flaws.

3. Project TALENT--a large volume of relevant data, but obsolescent and technically flawed, hence probably no more than a fair data source.

4. A Panel Study of Income Dynamics--careful technical underpinnings, but very sparse data on the relevant cohort(s) and some doubts about sample representativeness lead us to judge it a poor source of data for studies relevant to postsecondary education policy.

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INTRODUCTION

I have examined the possibilities of using four selected data files for policy-oriented research concerning the postsecondary education and work experience of high school graduates:

1. The National Longitudinal Survey of the High School Class of 1972, initiated in 1972. (NLS-HS)
2. The National Longitudinal Surveys of Labor Market Experience, Male and Female Youth Cohorts, initiated in 1966 and 1968, respectively. (NLS-LF)
3. Project TALENT, initiated in 1960. (TALENT)
4. The Panel Study of Income Dynamics, initiated in 1968. (PSID)

A discussion of all possible uses, or an item-by-item examination of each survey, would fill volumes. The discussion which follows is limited to a general description of the data collected and comments on its possible relevance to research involving traces of the progress of youths after they leave high school.

A few caveats are in order at the outset. The full range of possible uses of any survey depends upon the imagination and ingenuity of researchers who seek answers to particular questions. One cannot adequately assess a survey data base in very general terms; whether or not a survey is useful depends on the explicit question(s) to be answered and on the kind of analysis contemplated.

Any survey may or may not have included a question which might provide data relevant to the research problem. If a question relevant to the problem is included in a given survey, the responses may or may not be usable, depending on such factors as the item response rate, the precise wording of the question, its locus within a set of questions, response options (if any) provided, and the coding scheme used. Not only the questions, but the data collection procedure, the historical time (year, month, sometimes even day) at which data were collected, the variables used to stratify sampling, and sometimes the exact sampling frame used may all affect the adequacy of the data for a particular research question.

Surveys are (or are supposed to be) designed for specific purposes, i.e., to collect specific information in a particular form. A secondary analyst considering their use for purposes which may not coincide with the original intent must examine them in detail to determine whether or not they have provided information suitable for answering his specific question. Consequently, it is not entirely appropriate to attempt blanket assessment of the possible uses of a data base. The results of such an attempt may be misleading, since a survey judged not very promising in general could prove highly useful as a source of particular data, and vice versa.

These caveats shape the assessment which follows. The findings are tentative and stress limitations which might prevent use of the

data for policy research. It should be noted that all four files can contribute to examination of specific factors affecting access to and persistence in higher education, as well as the short-run work experience of young people who do not enter college.

I have given some attention to the possibilities of linking data from the different surveys to conduct trend analysis. Although such analysis has obvious appeal, I think it will not be feasible for many items, owing to technical differences and flaws in the four surveys. Nevertheless, I think it is inevitable that findings based on these surveys will be compared.

To assist the policy analyst in evaluating such comparisons, I describe below selected features of the data files. Throughout the discussion, the NLS-HS was used as the basis of comparison for discussing the other surveys. A short assessment of each data source appears as the summary of this paper.

USES FOR POLICY RESEARCH: POTENTIAL AND LIMITATIONS

These four files vary markedly in the kind, amount, and quality of data available. These and other differences should be considered before they are used for policy-oriented research. This section presents an overview of some important features which will influence such uses.

Information Content

NLS-HS

NLS-HS seeks to provide detailed information on a wide range of postsecondary experiences. If problems of item nonresponse can be overcome, the NLS-HS will provide more current information about the first years after high school than any of the other files. With an emphasis on details about postsecondary education, NLS-HS also will contain details on labor force experience, data on social and political participation, and special problems (chiefly work and family attitudes and child care) faced by women entering the labor force. If such details are indeed forthcoming,* the NLS-HS promises to provide a wealth of information concerning postsecondary experience.

The sample size is more than adequate for detailed analyses and the overall response rate has been quite high in the first two follow-ups, hence NLS-HS data should be usable for both descriptive and causal studies.

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*As I have noted elsewhere (Selby, 1976), the intended scope of the survey threatens the success of data collection. I need not reiterate my previous points about possible biases from item nonresponse.

Despite biases from item nonresponse, it should be possible to investigate a wide range of questions about relationships between high school and postsecondary experience.

I believe it is too early to make judgments about the possible uses of the NLS-HS. At present, data only extend to the fall of 1974 and much of the detail on this period is marred by high item nonresponse. The file now contains fairly complete and extensive data about the high school experience of sample members,* with special emphasis on curriculum; appraisals of the school, its staff, and programs; plans and aspirations; sources of influence on decisions (peers, parents, and school staff); and other social-psychological traits which might affect later experience. Data are available about the school qua organization, and about its counseling program and staff. Data from the follow-ups are fairly complete for broad activity states (in school, working, ever go to school, and the like) but, as noted, details are often incomplete.

As matters now stand, I see the NLS-HS as useful mainly for studies of the impact of high school experience on short-run, general postsecondary activity. There appears much to gain from investigating these relationships, particularly given current concerns about the possible effects of an alleged decline in the "content" of high school curricula. Such analyses might yield evidence relevant to determining whether or not the Federal government needs to intervene in some new way at the high school level in order to influence postsecondary activity.

*But some 5,000 (about one quarter) of the total sample provided only rudimentary information about high school. They were not contacted until fall 1973, in the first follow-up survey and were not queried about the same mass of details concerning high school as were those reached while in the last weeks of high school.

Not the least of the good features of the NLS-HS is its currency. The new data should permit updating of older estimates of relationships between high school and postsecondary experience. Even though details may be suspect, the basic activity-state information is complete enough to support such reassessments for continuing concerns like access and persistence in education, employment and earnings in the labor force, and marriage and military service.

NLS-LF

Were it not for relatively small samples of high school seniors and some obsolescence, the NLS-LF would undoubtedly be the most generally useful data file among these four. It contains a good balance of information about education and work, aspirations and accomplishments, and plans for the future and explanations of why past plans didn't work out. The data are complete and extensive, though not as detailed on some matters--other than work experience--as other surveys. There has been some doubt about the representativeness of the sample, but explanations for the source of differences are reasonable. *

The NLS-LF youth cohort files have some information about characteristics of the high school attended, whether or not there was an

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*For the male youth cohort, estimates of school enrollment, labor force participation, and unemployment rates differed markedly from supposedly comparable CPS estimates at the first interview wave. These are explained chiefly in terms of the effects of known differences in reporting between first-time and reinterview sample members, as well as other details of the data collection method and date. See Parnes, et al., (1971).

accredited college in the area, details about the local youth labor market, individual scores for mental ability, a rough scale of "knowledge of the world of work," and a scale measuring perceived control over one's life chances. Data about schooling include not only current activity, but completed education, curriculum, what courses were most and least liked, and college major (if any). There is basic information about health and family (including age, relationship to respondent, and basic school/work data on every member of the household), reading materials in the home, and various other environmental influences. Measures of job attitudes (i.e., toward the particular job) and work attitudes (toward work in general), and education and work aspirations are available.

Information about education is much less detailed than information about labor force experience, though it includes coverage of enrollment, schooling plans and hopes, reasons for changes in plans or participation, tuition costs of schooling, and amounts of aid. One area to which substantial coverage is given is vocational training, with separate inquiries about the nature, length, source, completion status, and use of vocational training in technical institutes, on-job, correspondence-, and regular-school settings. This emphasis on non-college postsecondary education is not found in other surveys, though NLS-HS has some data about participation in similar training.

For young women, the NLS-LF also contains sections dealing with attitudes about potential conflicts between work and marriage/motherhood, and factual information about child care arrangements and their effects

on labor force activity.

This "sampler" indicates the type, but not the full extent, of data available in the NLS-LF. (There are, of course, standard background items which I have not listed separately.) In terms of content and completeness (overall response and item response), this data base can be considered a major source of information relevant to policy studies. Its age and small sample size (in the high school senior cohorts) are important limitations which I have mentioned above. I think this file can be used quite well for examining "causal" relationships, but might have reservations about its use for descriptive purposes.* NLS-LF data are by no means as complete with respect to family circumstances as those of the PSID, and offer much less information about the high school experience than the NLS-HS. On the whole, however, it supplies a sufficiently wide range of information about each of these areas to compete well with either NLS-HS or PSID.

A final point in favor of the NLS-LF data file is that a considerable amount of analysis has already been published. Some desired information may be already available, and the published analyses can provide a starting point for other investigations with the same data. In addition to five volumes of analysis of the male youth cohort, there are

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*See footnote, p. 6. Although it seems probable that the matter has been satisfactorily resolved in the ensuing years, I found no direct statement to that effect, hence prospective users might want to obtain confirmation that any biases have been corrected. Descriptive reports based on the data have been published under the auspices of the U.S. Dept. of Labor; see Parnes, et al. (1970, 1971) and succeeding volumes.

three volumes on the young women and some two dozen papers based on data from the two youth cohorts, * which collectively supply a sizable base of analyzed data from which to initiate new analyses.

TALENT

Project TALENT suffers by comparison with the other data bases. TALENT has response biases, low overall response rates in its follow-ups, and some other technical flaws, and the data may now be obsolete. Probably owing to these limitations, it has been relatively little used. **

TALENT does have some possible uses, despite its limitations. It now offers the only long-term follow-up data available for analysis, though it is rivalled by NLS-LF, which should offer nine-year follow-up information on the male youth cohort (1966-1975) within the near future. At present, the TALENT 11-year follow-up offers the only data, for both males and females, on the decade after high school.

Another point in favor of TALENT is extensive psychological data obtained in the base year. These data include a large amount of information on abilities, interests, aptitudes, general and specific knowledge, and values. None of the other data bases has as much detail about the individual psychological traits of high school seniors, hence TALENT may

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*Known to and listed by the Ohio State University Center for Human Resource Research in the NLS-LF handbook.

**A large number of publications have drawn on TALENT, but there is much redundancy. Considering the long period of availability (since 1964), TALENT data have been little used.

provide the richest store of such information now available. To the extent that analyses are not precluded by nonresponse bias, TALENT data offer the best prospect of relating such psychological data to post-high-school education and work.

In other respects, TALENT offers no data which are now unique. It contains base year information, much like that available in NLS-HS, about background, curriculum, college plans, and the like. Its information about post-high-school education and work is fairly standard, certainly no more extensive than that planned for NLS-HS.

The one-year follow-up questionnaires* focus chiefly on educational activity, with only basic information obtained about employment. Considering the mass of information obtained in the base year, the first follow-up is curiously lacking in detail.

The five-year follow-up focuses about equally on employment and education (though again it is short on detail by comparison with the base year). It also probes marriage and child-rearing experience and expectations.

The eleven-year follow-up collected substantial detail on current work and some information about the intervening work history. Basic information on educational attainment, marriage and children, military experience, and assessments of current life situation was also obtained.

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*Content of questionnaires varies somewhat among the four 1960 grade-level cohorts. I have here abstracted the commonalities.

TALENT offers a nearly unique potential for analyses involving comparisons among siblings, * but longitudinal data on sibling pairs may be scanty, given high sample attrition.

Except for the unique psychological data base, I am not enthusiastic about the potential of TALENT for current policy research. Its age and technical flaws would tend to render most findings suspect. Since data of better quality and coverage are available from more recent sources, I recommend focusing effort on them.

PSID

PSID suffers from a paucity of usable data about high school students, seniors especially (owing to small estimated sample). Its chief advantage is a wealth of good-quality data about the composition and economic situation of families, including items on numbers, ages, and relationships of household members, amounts and sources of family income, family expenditures, parental hopes and expectations for education of their children, and the like. The PSID would thus prove a rich source of information for basic research on relationships between family circumstances and children's postsecondary experience.

A serious data limitation is that, owing to its main focus on family income dynamics, rather little information about non-heads of families was collected. Except for about 6 per cent of the children who

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*Some siblings are doubtless included in each survey, but TALENT's large base-year sample (N approximately 400,000 over four grade-level cohorts) will provide the largest number by far. Jencks (1968) and Jencks and Rainwater (1974) have used both TALENT and PSID data to investigate schooling and earnings of siblings.

established their own families* each year, the PSID provides information only on whether or not currently enrolled in school (ages 5-25 only), whether or not stopped going to school during the prior year (for follow-up years), highest grade completed (those not currently enrolled for 1968-1971 and for all as of 1972), the prior-year total income, its source(s), and the number of hours worked in prior year.

Educational data on household heads (or wives if any) is likewise limited to years completed, including college degree or not and field if college graduate. Financial information on household heads (including occupational data) is quite detailed and extensive, but this would be available only for those 1968 high school seniors (and their younger peers) who become heads or wives during the course of study. Most of the children in 1968 families who established new families were girls. For them, detailed data would consist mainly of information about husbands' (non-sample members) occupations and earnings as well as overall family finances, since the prime respondent throughout the study was the male head of household (where he existed).

Despite its limitations, I believe some useful information might be gleaned from PSID. It can provide some data for exploratory studies bearing on policy issues such as how direct financial aid to families might compare with aid to individual students in influencing postsecondary

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*A rate which varies by age and sex of the children.

education. It can provide some data for basic research on such matters as the influence of: (a) older siblings' postsecondary activity upon that of younger siblings, (b) household head's mental ability (roughly measured by a verbal ability test in 1972) upon his aspirations for educating children, and on their postsecondary activity, (c) changes in family composition and/or economic well-being upon children's school activity, and the like.

In brief, the PSID offers only sketchy data on education and labor force participation for a relatively small number of sample individuals who were in high school at the outset of the study. It probably offers most as a source of data for research about the influences of details of the family background and circumstances, especially changes therein, upon postsecondary activities of children. It is not an ideal source of information relevant to postsecondary education policy, but for basic research of the sort described, it is unmatched by any of the other files.

Possible Joint Uses

In drawing comparisons among these data bases, I later cite some possible joint uses by way of illustration. Those examples are not included here, but should be reviewed as part of this more general discussion.

At the outset of my examination, I thought it might be possible as well as desirable to use these four surveys as sources of trend information. It still seems desirable, though the possibilities of making comparisons

seem severely limited by technical differences.* Since it is likely that some policy discussants will make comparisons of findings from the different data bases, I think it would be informative to examine some basic relationships (such as the correlation between parents' and children's education) as estimated by data from each of these surveys. Comparisons among disparate surveys might be so used. Models generated by data from surveys as different as PSID and TALENT might be tested with NLS-HS data, or those from older sources might be tested with more recent ones, to assess stability of relationships under varying technical and temporal differences. Schweitzer and Smith (1974), for example, developed a model on the NLS-LF male youth data, and subsequently tested it with PSID data on household heads.

The results of such investigations should prove informative with respect to the policy maker's use of research data. If, despite known technical differences and the effects of time, specified relationships prove stable in these four surveys, a policy maker could have increased confidence in the reliability of past evidence. Such confidence, of course, is essential to the use of research evidence as a groundwork for policy. In the more likely event that a given relationship varied rather markedly across surveys, the data would have provided some evidence of the bounds

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*Schrader and Hilton concluded that they could perform trend analyses of high school achievement with TALENT and NLS-HS data. I am not fully convinced by their argument. See Schrader and Hilton (1975).

within which estimates vary because of technical and temporal differences.* The policy maker needs to know the degree of error introduced by the combined effects of such differences, since his reliance on data for future planning can then be guided by a rough idea of how reliable his information may be.

A more substantive use, noted above, would be to derive hypotheses on one data base and test them on another. The NLS-LF and PSID are likely candidates for such a tactic, since their sampling and data collection methods** are fairly comparable and each would provide basic activity data for youths of similar age and not widely separated in time.

TALENT and NLS-HS are also likely candidates for such a use, though they are widely separated in time and differ in other respects. TALENT and NLS-HS may be complementary with regard to their differing emphases. TALENT probed heavily into the information, interests,

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*A review of estimates based on each data file should be an early step in any effort to set bounds around the degree of variation induced by technical and temporal differences among the surveys. In the absence of reported findings, direct data manipulation may be needed. I think it would be useful for OASE to request some research organization to prepare a report concerning the variability of estimates, drawn from the several surveys, for particular relationships which are of major policy interest. To remove the mode of analysis as a further source of variation, it would be desirable to have the analytical work done by one center, using one analytical procedure.

**However, data for NLS-LF youth were obtained directly from the youths, whereas PSID data for most younger people will have come from a parent. This and other differences already discussed suggest the need for caution in comparing the two data sets.

abilities, and aptitudes of students; NLS-HS probed less extensively in these areas and much more heavily than TALENT in the areas of student plans, attitudes, assessments of school quality, decisions, preferences, and the like. That is, TALENT emphasized "innate" characteristics, and NLS-HS stressed judgment and social influence.

TALENT could be summarized as having a psychological orientation, while NLS-HS is more sociological and social-psychological. Given these content distinctions, it seems reasonable to consider using the two data bases to assess which classes of variables serve better as predictors of postsecondary activity. Such an effort might yield useful information regarding what mechanisms (psychological or social) could best be tapped to influence decisions about postsecondary activities, or to assess how successful social appeals may be in the face of well-developed "innate" psychological characteristics.

There may be limited areas, such as the link between ability and postsecondary activity, or very specific relationships, such as that between family possession of reading material and postsecondary education orientation (e.g., plans or hopes to attend college), for which comparison of TALENT and NLS-HS data would be useful.

As the foregoing suggests, I think it likely that most questions which might be investigated by comparison of TALENT and NLS-HS data are not in the domain of Federal policy on higher education. Rather, they are in the domain of basic research on the antecedents of postsecondary

activity. To the extent that Federal policy makers may be concerned with the effectiveness of various ways of influencing (mainly, encouraging) entry into postsecondary education, the joint use of TALENT and NLS-HS data may be worthwhile.

Finally, it may be possible to investigate the impact of particular historic events on given relationships.* One would expect, for example, the end of the Vietnam war to influence college plans, since going to college was seen by many as a way of staying out of the war. Data from NLS-LF and PSID might be compared with that from NLS-HS to examine such a hypothesis, since the two former surveys began during the build-up and peak phases of American troop assignments to Vietnam. I do not want to push this suggestion very far, since all of the differences among the surveys will be confounded with historic events. Nonetheless, for some very important policy issues, it might be possible to clean up the data sufficiently to permit some rough approximations of the impact of important historic

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*A policy maker should be interested in the impact of historic events. While not all such events are likely to be of interest, it sometimes happens that they induce fundamental changes in secular trends. An example is the influence of the Second World War upon higher education and other aspects of American society. It is important that a policy maker attempt to assess whether some major historic event has produced fundamental changes within society, since if such changes have occurred the policy maker is confronted with a new situation in which earlier knowledge may no longer apply. Under such circumstances, the policy maker is doubly burdened by the need to determine what knowledge will be relevant to policy formulation for the future as well as a need to help determine, via policy, what conditions will ultimately result from changes set in motion by an historic event.

events upon observed educational experience.

Despite many reservations about the comparability of data from these four surveys, I think it might be worthwhile to commission an attempt to use them as a means of assessing whether or not the events of the 1960s marked a major turning point in higher education. Except for PSID, there are enough data in each survey to permit some assessment of the nature of changes in student attitudes toward higher education and related matters, allowing at least an exploration of the broad question. *

Sample Sizes

Obviously, the size of available samples critically affects their usefulness for different topics of policy research. Generally (depending upon the sampling design), larger samples produce more precise estimates of population parameters. They can also be more minutely subdivided to allow scrutiny of special subgroups.

The four data bases under consideration vary greatly in sample size. Considering only the number of high school seniors in the samples at the first (base year) data collection, I estimate that the range in size is from about 200 to 250 for the PSID up to 81,000 for TALENT.** For

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*Flanagan (1971, 1972) provides evidence of small changes in the degree of "realism" involved in expressed vocational choice, between 1960 and 1970 high school students. Such changes would presumably carry through to plans for postsecondary education.

**My estimates for PSID and NLS-LF are "ballpark" figures derived from age distributions. I have no confirmation for the PSID estimate, but for NLS-LF, I obtained an educated guess from John Grasso, of Ohio State University, which generally agrees with my prior estimate.

NLS-LF, I think there are about 480 males and about 550 females.* For NLS-HS, there were about 16,000 seniors actually queried in the base year, plus about 5,500 more who had been seniors at the time but were not queried until later, for a total of roughly 21,500. Non-response, however, severely shrinks the data base for TALENT and for selected items in the NLS-HS.

Efforts to build up the size of samples by merging data for different cohorts require great caution. The case of the two NLS-LF senior sub-samples** illustrates the sort of difficulties which are likely to be encountered when merges of data are attempted across single-year cohorts within any data base, and more so for any efforts to merge or compare across different bases.

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*The NLS-LF youth cohorts were separate surveys of males and females, with age ranges from 14 to 24 years. Each of these samples has roughly 5,000 individual respondents.

**It may not be easy to merge the NLS-LF "boys" and "girls" samples. "Boys" were first interviewed in 1966, "girls" in 1968. Thus, seniors' responses to questions in the first interview instrument would tap two cohorts at the same stage in high school, but would be for males leaving high school two years earlier than females, and therefore subject to different societal conditions (which would confound sex with time). Alternatively, if the merge involved boys and girls who were seniors in 1968, the boys would be responding to the second follow-up questionnaire and the girls to the first (base year) instrument. In the latter case, even where questions are identical the boys will have had two "practice" rounds earlier, which might affect response. While it might seem a simple matter to merge the "boys" and "girls" data to yield a sample of about 1,000 high school seniors, there are likely to be many problems of exact comparability.

Because the number of high school seniors for PSID and NLS-LF is so small, it is doubtful that very accurate estimates of population descriptors can be obtained from the single-year cohorts. Were it desirable to merge several such cohorts together (e.g., for a range of ages like 14-to-19) for some analyses, the NLS-LF could certainly be made large enough to give accurate estimates. Whether such aggregation would be desirable from a policy standpoint depends, of course, on the matter under investigation. *

Within individual surveys, such as TALENT, changes in societal conditions from year to year could impose systematic biases which might be important for some items. Should such time-related differences be confounded with other differences between cohorts, merged data would be very hard to analyze.

On the other hand, merging single-year cohorts within one data base might prove advantageous for some investigations, since it would not only build the sample size but also "iron out" effects of short-term fluctuations in societal conditions. Thus, if one were to consider the first five years after high school as a critical "life cycle" or career stage regardless of its chronological date (as is the case with TALENT), it might make good sense to merge cohorts who began their five-year periods at different times, to get a fix on what is typical of this period when short-term influences are buried by the fact of aggregation. (Care would be required, of course, to assure that each cohort be properly weighted so that no one could dominate the results.) This could be a tricky business,

*There may be some issues for which statements about "teenagers" as a group would be acceptable, in which case it would make sense to merge all 14-to-19 year olds.

but might be more informative than considering a single time-bound cohort. Such merges would make little sense for investigations devoted to describing the state of affairs during any narrow slice of time, unless one wished to describe, say, the first half-decade of the 1960s as conceptually a single period.

Judgments about the effects of sample size as an analytical limitation are, like other judgments, dependent on the specifics of the research question. The size alone cannot be considered in isolation from other features of the data and the analysis plan.

Sampling

I have mentioned the general problem of sample comparability and sampling. All four of these data bases purport to have begun with nationally-representative samples. If we conceive of "high school seniors" as a persistent segment of the national population, then it would be desirable that each sample represented that segment for its base year. The way the samples were chosen does not guarantee that this is so.

There are two broad differences which distinguish TALENT and NLS-HS from PSID and NLS-LF. The two former studies picked samples of high schools (and students within them), whereas the latter were samples of households (and school-age people associated with them). If one supposes that all high school seniors are part of households, then a representative sample of households should yield a representative sample of seniors. However, there are reasons why the several samples may not have tapped exactly the same "senior" universe.

First, not all seniors are associated with households as these are defined for the household samplings. The household samples, modeled on the CPS sample, were drawn to represent the civilian non-institutional population, hence exclude military base housing and institutions (e.g., jails, mental hospitals, etc.). Some small proportion of high school seniors would, in any year, be residents of households on military bases or of institutions for orphaned or abandoned children, or the like. Thus CPS-type household samples would exclude from the "senior" universe a portion of those who (presumably) would be included in the universe sampled via high schools. In the same way, it is possible that some high-school students--such as handicapped students taught by visiting teachers, the privately-tutored rich, and children in military dependents' schools in foreign locations--would be excluded from the universe defined for samples based on high schools. For most purposes, such minor differences in the universe sampled can be ignored, but for some very specific questions the excluded categories might significantly affect research findings. For example, one could learn nothing about the college access of physically handicapped students if they were never available through sampling of high schools. They would, presumably, be picked up by household samples, but would be excluded either way if they reside and are taught in custodial care institutions.

Assuming that excluded portions of the "real" universe generally pose no severe problems, there are still some differences which might interfere with direct comparisons of data from the several bases.

Although TALENT and NLS-HS both sampled high schools, the older study used fewer stratification variables than were adopted in the NLS-HS sampling design, and some of the same stratifying criteria were sometimes employed differently. For example, both TALENT and NLS-HS stratified on school enrollment, but the size categories differed. Although I lack complete information about the sampling designs of PSID and NLS-LF,* what is known suggests that they were likewise not stratified identically.

Finally, the two education-oriented data files differ from the two labor-market-oriented files in the type of stratification variables used. For example, whereas such factors as school enrollment and drop-out rates were used to design the samples of high schools, these were not part of the design for the labor-market household surveys. Conversely, whereas NLS-LF uses factors such as average unemployment levels and industrial concentration in its stratification, such factors were not considered in the high-school sampling.**

Since factors which affect (say) current unemployment rates

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*The information is available from the respective research organizations, but the present purposes were not thought to warrant detailed examination beyond the information given in general documentation.

**These differences stem from the purpose of stratification, which is to minimize sampling error in population estimates for certain classes of data. When one is chiefly concerned about accurate estimates of unemployment rates and the like, one uses stratification variables that affect such rates. When one is concerned about rates of college entrance, one uses variables that are expected to yield statistically precise estimates of those rates.

may not be the same as those which affect college entrance, a stratification design suitable for precise estimates of the one may not be "best" for getting precise estimates of the other. If so, estimates will differ in the degree of precision and comparisons of estimates based on two different sampling designs may require adjustments to eliminate the effects of sampling design. These effects may reduce the precision of educational estimates in the PSID and NLS-LF, and the precision of "work" estimates in TALENT and NLS-HS.*

Evidently, the adequacy--in terms of representativeness--of any of the four original samples can only be considered sensibly with regard to the particular estimates in question. The sampling design features may influence any researcher's judgments about the adequacy of the data base for his particular study. I am not in a position to endorse or reject any of these four data bases on grounds of sample design. I mention the matter chiefly for completeness in the discussion of possible limitations. Should there be major concern about the comparability of the samples as affected by design features, it would be necessary to comission a detailed study of the sampling schemes by a sampling statistician. I have not seen fit to take the matter this far at this time.

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*Sampling statisticians are theoretically able to suppress such design effects by appropriate statistical manipulations. However, I hesitate to assume that all analysts of these data will make such adjustments.

General Limitations

Data Obsolescence

An important limitation of all surveys, especially relevant where policy research use is contemplated, is obsolescence. Data bases age, and information which may have been quite accurate when the data were collected may be rendered invalid by changes occurring over time.

Unfortunately, one cannot rely simply on chronology to decide whether or not a data file is obsolete. The real test is whether or not the conditions under which the data were gathered hold in the present or, more important, are expected to hold in the future for which policy is to be made. If, hypothetically, societal conditions which existed in 1960 were to exist again in 1980, TALENT data might be more relevant to policy planning than data from the NLS-HS. Since we do not know exactly what conditions will exist in the near future, we have to suppose that (a) any of the four data files may be obsolescent, but that (b) chronologically older data are more likely than recent data to be obsolete for 1980s policy.

Obsolescence is an obvious limitation for descriptive studies which applies equally, though perhaps less obviously, to "causal" studies. The notion of causality as an invariant relationship notwithstanding, "causal" studies will be affected by data obsolescence. For example, if by 1980 there were no public aid to individuals seeking higher education, the correlation between family income and probability of attending college would

most likely revert to approximate that holding in, say, 1940.

The general problem of obsolescence is aggravated by the period these surveys span, because the decade of the 1960s was one of social ferment and marked fluctuations in educational, economic and political affairs. Any prospective user of these data must, then, consider the likelihood that particular information from them is "time-bound" and irrelevant to future policy. While I don't want to paint too dismal a picture, I think obsolescence may be an important limitation on much of the data in question.

A brighter side of the same coin, suggested above, is the use of data from the four files to assess stability of certain relationships. Should a given relationship be shown to hold in all of these data, despite the turmoil of the sixties, one could have considerable confidence in its probable continuation in the future. Obviously, whether or not aging of the data is a problem or an asset depends on what questions are under investigation.

Another aspect of timeliness needs comment. For some purposes, "old" data may be part of, or related to, a "most recent" block of data. Thus 1960 TALENT senior data are part of the most recent available information on longer-term education and work experience. When related to the TALENT eleven-year follow-up (1971) and intervening follow-ups

in 1961 and 1965, the 1960 data comprise a significant part of this most-recent block (series) of data, even though they are the oldest of all discussed here. Since TALENT's eleven-year series is the most current, it may be necessary to rely on it for some policy analyses even though the experience of 1960 graduates may have little relevance for those graduating now. *

Incomplete Data

Both general and item nonresponse may render data from any survey incomplete, and therefore possibly unrepresentative. TALENT data are probably the most troublesome in this respect. Although TALENT began with an enormous sample of high school seniors, it suffered severe losses in the ensuing follow-ups. Of 81,000 seniors in 1960, only 63 per cent (51,500) supplied 1961 data, only 40 per cent (32,500) supplied 1965 data, and only 30 per cent (24,400) supplied 1971 data. While the absolute numbers remain large throughout, Project TALENT staff analysts themselves question the representativeness of the sample in 1971 and, by implication, throughout the follow-up series. ** They note that the 1971 data are biased by underrepresentation of less able, poorer, and black sample members, the last group extremely poorly represented. TALENT documentation

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*The hazards of relying on possibly obsolete data for information about long-term relationships are inherent in any dynamic and nonrepetitive process. Those who make policy for a changing society cannot skirt the problem, though they may be informed by the "old" data as to how they may prevent recurrence of undesirable relationships.

**Yen and McLaughlin (1974:6-14 passim.).

gives no general statement about the levels of item nonresponse, but reliance on mail-out questionnaires suggests that it will be high for many important types of data.*

PSID documentation** reports biased representation stemming from high general nonresponse rates in the first two years (24 per cent in 1968, 11 per cent of 1968 respondents in 1969, for a total loss of about one-third of the originally-intended sample). Owing to data collection by personal interview, item nonresponse is not indicated to be a major problem, though it was sufficiently high to warrant use of special techniques for assigning missing values.

The NLS-LF had better initial experience, with reported response rates of 91 per cent and 93 per cent for the "boys" and "girls" respectively. In the last regular interview wave (1971 for boys, 1973 for girls), data were obtained from 77 per cent of the original boys and 86 per cent of the original girls. Reportedly, the use of personal interviews suppressed item nonresponse to levels rarely exceeding 10 per cent.

By contrast, the NLS-HS has had excellent overall response rates (over 90 per cent) through the first two follow-ups, but was plagued by heavy item nonresponse in the first follow-up (Selby, 1976).

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*Bowles (1969) indicates that item nonresponse was particularly troublesome for his analysis of the 5th year follow-up of black males from the 1960 senior cohort. His remarks suggest the problem is not confined to this subsample.

**Survey Research Center (1972).

Despite various approaches to correction for incomplete data, loss of direct information from some members of a carefully designed sample almost inevitably reduces the degree of confidence one may hold in the representativeness of the data. It is a practical impossibility to completely fulfill the plan of any survey--something always goes wrong--but the loss of reliable information is a matter of degree. In judging the limitations imposed by incomplete data, the policy maker should probably consider not only the extent to which each of these data bases approaches a technical ideal, but also whether or not they provide better information than would be available in their absence. This judgment cannot be made on the assumption that any data are better than none, since biases may mislead, hence my suggestion that methodological studies be commissioned to explore the degree of error resulting from incomplete data and other technical problems. The policy utility of any of the four surveys I have considered depends heavily on empirical evidence that the information they offer is more reliable than that available from other, including non-scientific, sources.

SOME PREVIOUS AND POTENTIAL USES OF THE DATA FOR POLICY RESEARCH

In an effort to determine how data from the four files have been used for studies of interest to Federal policy makers in the field of education, I have examined a large number of government reports, journal articles, pre-publication drafts, and a few notable books which contain analyses of data from one or more of these archives. The literature search relied chiefly on materials available in the library facilities of the National Institute of Education, the Department of Labor, and the Department of Health, Education, and Welfare. Some materials included in lists of uses were not available from these sources; in such cases I have opted to forego direct examination of the material and to rely on "thumbnail" descriptions of study objectives or, in a very few cases, on a study's title (which I have found to be a reasonably reliable indicator of topical content). My examination is by no means exhaustive, but constitutes a fair sampling of uses.

I have made no attempt to undertake individual theoretical or methodological critiques of the studies reviewed. Such a project would, in my opinion, reveal much to be desired in the quality of information extracted from the data, but was beyond the scope of this effort. My impression is that analysts often strain to impose meaning on data, particularly when multiple regression analysis (or other correlational techniques) is the chosen analytical tool. Since this technique tends to be utilized by many of the analysts,

much of the "policy relevant" information gleaned from the three surveys which have already undergone considerable analysis (excluding NLS-HS) is at best open to thoughtful debate. Indeed, many of the uses of the data, especially by economists who dominate use of the NLS-LF and PSID bases, might be characterized as "ripostes" to other analysts' uses of the same or similar data--that is, as debates concerning the adequacy of conceptualization, measurement, or interpretation of prior analyses of the given data.

Of the four surveys under consideration, only two have been used extensively for research relevant to educational policy. The NLS-HS has been available for too short a time to have had widespread use, and PSID has been used chiefly for other purposes, owing partly to a paucity of data on education and partly (I suspect) to its "billing" as a data base pertinent to the study of family income dynamics. TALENT data have been more extensively analyzed than NLS-LF, with respect to educational issues, probably owing to its greater longevity and "billing" as an educational data base.

It is important to understand what I have considered "policy relevant" for education. Although "respondent's education" is used as a control variable in nearly every study, I have given attention only to those in which the main focus of analysis was upon determinants or consequences of education, especially postsecondary education.

As a generalization, there have been two main uses of NLS-LF and TALENT. Studies using these data bases predominantly focus on

the occupational/income correlates of education or on determinants of the amount and kind of education attained. NLS-LF data have been analyzed chiefly by economists, together with a few sociologists interested in stratification (as have the PSID data). By and large, analyses of NLS-LF data have focused on the effects of quantity and quality of schooling upon labor market experience (earnings, unemployment, occupation, mobility). The dominant use of NLS-LF data has been in efforts to assess the unique contribution of education to earnings, i.e., to assess the economic returns to investment in education.

TALENT data have been analyzed mainly by educational researchers, and tend to focus chiefly upon the effects of personal characteristics and high school experience upon educational and occupational choice and on labor market outcomes. TALENT's follow-up data on postsecondary education are limited in scope (roughly ten questions per follow-up, mainly covering amount of education, school attended, degrees earned, course major), which of course limits the amount and kind of analysis that can be performed with postsecondary education as a pivotal variable.

Miscellaneous uses include two studies of gifted children, one using TALENT data and another (now in progress) using NLS-HS data; one effort to identify peculiar characteristics of "unusually effective" high schools, based on TALENT; three studies involving efforts to tease out the contribution of unique individual characteristics to subsequent labor market success by studying siblings (including twins), all using TALENT

data, one using PSID as a supplement; two studies, one based on NLS-LF and one on PSID, examining "division of labor" between husbands and wives; one study of the effects of marriage plans on educational aspirations, based on TALENT; one study of the influence of parents' educational aspirations upon children's decisions to leave the parental home, based on PSID; and three studies best described as chiefly methodological.

Carroll and Morrison (1976) list a number of studies now in progress which use NLS-HS data. Topics listed conform generally to the main uses of TALENT and NLS-LF, but include also two studies focusing on military personnel, one investigating several aspects of student financial aid, two efforts to estimate demand for education, and one focusing on continuing education. Bailey (1976) offers a list of NLS-HS uses which include some "unusual" uses, such as a study of the decline in SAT scores (see Schrader and Hilton, 1975) which will combine NLS-HS and TALENT data and a study of correlates of reading.

My survey of published materials, incomplete though it may be, suggests that the four data bases have been used chiefly for investigation of a narrow range of topics: effects of high school experience and personal/social characteristics of students upon participation in postsecondary education and work, effects of education on economic "success," and vocational choice. To be sure, the range of particular variables encompassed by these inquiries varies, but nearly all place heavy emphasis on

a relative handful of variables: sex, race, socioeconomic status, educational and vocational aspirations, intellectual "ability" (variously measured), educational attainment, kind of education (e.g., vocational, four-year college), and "quality" of schooling (variously measured). The most ambitious efforts to encompass a wide range of variables are those of W. W. Cooley and P. R. Lohnes (Cooley and Lohnes, 1968; Cooley and Flanagan, 1965; Lohnes, 1966), who have performed factor analytic studies and multiple discriminant analyses with several hundred items from the TALENT base year and follow-up data.

Studies based on NLS-LF and PSID, and some using TALENT data, do not attempt to focus on a single-year age cohort. For users of NLS-LF, data on the entire age group 14 to 24, or some subset such as those aged 18 to 24 (with or without other restrictions such as complete data, high school graduation, or the like) are the main source of information. This is almost certainly owing to the small numbers available in any single-year age cohort, though it may sometimes represent an effort to assess relationships "averaged" over several years to reduce the impact of short-term influences.

Users of PSID tend to focus likewise on blocks of respondents, such as children aged 16 to 25 at the time of first interview, male household heads aged 25 to 65, and the like. One user has investigated the effect of education on non-pecuniary work rewards (Duncan, 1974b) by examining data for all male household heads meeting certain employment restrictions. The same user examined data for

children aged 18 to 30 (at the last interview) who had formed their own households, to study factors affecting educational attainment (Duncan, 1974a). Morgan and Duncan (forthcoming) assess the impact of college quality on earnings, using samples of household heads partitioned by longevity of head status and level of education (four-year degree, some college). They also considered males and females (usually wives) separately, taking in all analyses only those with at least 500 hours of employment in 1974. I have found no case in which an attempt was made to consider a single-year age cohort of the PSID, probably owing to small numbers.

My review of uses of these data bases leads me to doubt whether the data have been exploited as effectively as they might have been. In the main, analysts have performed "static" rather than "dynamic" analyses, thereby taking advantage of only one special feature of the data collected. My reservations about "static" analyses have to do with the limitations on what they can reveal, as compared to what the policy maker needs to know. A short comment on some special features of the data is required to explain these limits.

There are two ways to obtain information about the experiences of people over periods of time. One is to contact each person once, and in that contact ask him to give information about the present and to recall the past. "Retrospective" data of this sort are subject to many sources of error, notably those associated with faulty memory, confusion

of time periods, and selective "revisions" of the past. The second, and preferable, way of obtaining longitudinal data is to make repeated contacts of the same person, each time collecting only information about current experience. Such "prospective" data (the kind obtained in these four surveys) are superior not only because they are free of many of the sources of error that plague retrospective data, but also because the collection procedure yields an objective record of the time sequence of experiences.

This definitive record of time order is a crucial property of prospective data which cannot be attributed, with certainty, to other kinds of data. It is crucial because it permits analysts to trace, accurately, changes from one condition to another, thus making possible well-grounded inferences about causality and developmental processes.

Moreover, an analyst using such data is able to distinguish patterns of experience which might not otherwise be evident: given two people, both of whom have had experiences A and B, it may be useful to make a distinction between "A then B" and "B then A". For instance, some experiences of a person might differ, if she lives first in a small town then in a large city, from what they would have been if the order were reversed.

Conversely, it is possible with prospective data to derive "relational" characteristics* which ignore differences in the experience

*Based on a relationship between two elements of data. When elementary data pertain to different times, these may be "change" variables.

of several people at a particular time (such as, living in a small town versus living in a large city in 1972) so as to locate common elements of experience. For example, two people may share the experience of a marked change in social milieu, though one moves from a small town to a large city while the other moves in the opposite direction. At neither time would the two live in similar surroundings, but the derived trait "major change in environment" describes a common element of experience which may be useful in explaining later events.

Causal analysis of information involving changes in situation requires a high degree of certainty about the time order of experiences. Consequently, prospective data offer unique opportunities for analysis because they provide a definitive record of sequence. They are perhaps the only reliable source of data for "dynamic" analyses.* They also offer (relatively) error-free data for "static" analyses,** though static analyses waste some of the information contained in such a data base.

Static analyses search for unique relationships between conditions, or data elements, at fixed points in time. For example, an analysis which seeks to determine a correlation between size of community (e.g., small town, large city) in 1972 and some later outcome

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*Official records, bearing certified dates, are another reliable source, but are not likely to be available for studies in which diverse information about the experiences of individuals is needed.

**The special feature of prospective data which is most used in the studies I have reviewed.

is a static analysis. By contrast, dynamic analyses search for relationships between patterns of change over time and later outcomes. For example, an analysis of the relationship between "rural-urban migration" and an outcome is a dynamic analysis.

Measures of the kind and/or degree of change over time are central variables in dynamic analyses. Because of their emphasis on derived "change" variables (e.g., "migration"), dynamic analyses use the information in a longitudinal (prospective) data base more completely than typically is the case with static analyses. Moreover, dynamic analyses can offer a different, and more "policy relevant," kind of information than can be obtained through static analysis.

If the research goal is to discover a good set of predictors for specified outcomes, or to describe accurately the nature and strength of relationships among elementary data, static analyses may be appropriate. But if the goal is to increase understanding of why relationships exist, or to understand developmental processes, dynamic analyses are needed. The information needs of policy makers more often call for the latter goal than for the former.

Assuming they are not spurious, associations between predictors and outcomes--which are the product of static analyses--presumably rest on some system of influences which links the two classes of variables (conditions). If this underlying system were disturbed, the associations would be expected to change. A major task of policy makers is to introduce

changes into existing systems, hence the performance of their function is likely to upset the basis of the descriptive/predictive knowledge which can be gleaned from static analyses. Unfortunately, changes in associations among variables which may accompany implementation of a policy cannot demonstrate that the policy per se induced the observed change.* Equally important, even if one were willing to attribute observed changes to the policy action, changes in static correlations cannot indicate whether the particular policy was in some sense "optimal." Other policies--some of which might be less costly or more politically palatable--might have been equally or more effective.

What a policy maker needs is an understanding of the processes of influence that lead to particular outcomes. A set of static correlations, resting on stability of an influence system, are of relatively little use. The policy maker needs to know how the system works (not just that it does) if he is to modify it to produce desired outcomes. Assuming adequate data, dynamic analyses are far better suited than static analyses to provide this sort of information.

The paucity of dynamic analyses of the data from the four surveys reviewed indicates a failure of the research community to exploit them completely for policy purposes. Despite various problems of data quality, I think it both possible and highly desirable to place greater

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*As is well known from placebo and "Hawthorne" effects.

emphasis on dynamic analyses.

A few of the analyses of TALENT data I reviewed are dynamic in orientation (Astin, 1970; Claudy, 1970; Flanagan, 1971; Schoenfeldt, 1969). Two can serve as illustrations.

Astin classified women as occupational "recruits," defectors," or "stables," on the basis of the change between occupational choice expressed in 12th grade and employment five years later. Using these three (derived) traits and ten occupational categories, she formed thirty subgroups, then contrasted these on certain characteristics of the subjects while they were in high school. Her approach combines static and dynamic analyses by using patterns of change as outcomes to be related to characteristics at a fixed point in time.

Schoenfeldt classified sample members, by change in early college enrollment status, as (a) non-college throughout, (b) "delayed-progress" (non-college to college), and (c) "normal-progress" (college throughout). He compared these groups on certain initial (fixed-time) characteristics and on the stability of their career plans over the period from high school to five years after graduation. By relating stability of plans to student progress, he performed a dynamic analysis involving influences of one type of change upon another. (Changes in plans as

related to changes in enrollment.) The study suggested that the career plans of "delays" crystallize more slowly than those of "normals," but that they come to resemble the latter. This use of the data not only provides some policy-relevant insights,* but also is instructive on what might have been lost by static analysis. Had the "delays" not been identified as a distinctive group, their peculiar characteristics would not have been revealed. Had only "normals" been studied, the capacity of high-school characteristics to predict college entrance would have been misstated.

Perhaps I should note that a variety of analytic techniques can be used for dynamic analysis. The distinction I have drawn is between different research goals and approaches to data organization. It does not rest on what methods of statistical manipulation are used. An analyst can use a derived "relational" variable in regression analyses as well as in cross-tabulation or other techniques (though few of the users of regression reviewed for this section seem inclined to do so). Some techniques are doubtless better suited than others for dynamic

*For instance, one might want to consider providing for follow-up and counseling of certain graduates who do not immediately enter college, in order to prevent "waste" of capabilities.

analysis, but the choice depends more on other considerations* than on the general approach.

To summarize, it is my impression that researchers have ignored much of the policy-relevant information available in these four data bases by relying chiefly on static analyses. I am inclined to think that greater emphasis on dynamic analyses would yield a better harvest of policy-making information by contributing more to understanding of the processes by which outcomes develop.

With respect to topical content, I am less willing to make suggestions. To some extent, this reticence is based on the limitations of the available data, to some extent on what I view as ambiguity surrounding what topics may properly be construed as relevant to making policy on postsecondary education. The past uses of the data, as I have noted, are confined within a fairly narrow range of topics: who goes to college (or, what kind of college); what occupational/earnings outcomes flow from education; what factors affect educational attainment. It may safely be presumed that researchers will continue to investigate these matters.

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*Such as the level or precision of measurement in the data.

It seems to me that policy-oriented research must take as its central topic those intervention strategies available to the Federal government to bring about some specified state of future conditions. This, of course, implies research which takes as given some well-defined set of Federal government goals for the social institution "postsecondary education," or which takes as its problem the specification of such a set of goals. In the first instance, policy research will focus on how well present or possible programs perform with respect to attainment of the specified goals. In the second instance, policy research will focus on informing the government regarding the popular desire for certain future conditions and/or on elaborating the societal system requirements which make specified future conditions necessary. In either case, policy research will assess the capabilities of the government for intervening in current conditions in such a manner as to bring about the goal conditions.

Most current research based on the surveys under consideration has little to do with goals per se, nor does it address the intervention strategies which might be available. The nearest approximation to a focus on intervention strategies are a few studies, now in progress with the NLS-HS data, which examine the influence of Federal student aid programs on postsecondary enrollment. To be sure, descriptive data concerning

(for example) differential enrollment in postsecondary education can have policy implications: given a goal of universal attendance differential enrollment is evidence of a need for intervention, and explanations for its existence may (or may not) suggest stratagems. Lacking such a clearly defined goal, however, evidence of differential enrollment does not automatically imply need for intervention, and is not obviously "policy" research.

Three of the data sets (excluding PSID) include statements of youngsters' educational aspirations, and all include items covering parents' aspirations for their children (only in the PSID is this obtained from the parents). Such statements provide the nearest available approximation to a measure of popular "goals" for postsecondary education. These should probably be examined closely to determine their implications for national goal setting. Most uses of these data that I have discovered employ aspirations as control or predictor variables rather than as outcome variables; I suggest a focus on them as the latter.

Three of the data sets (excluding PSID) include data on youngsters' occupational aspirations. These are also approximate goal measures, and should be examined closely as outcome variables to determine what factors affect them. The TALENT psychological data have already been heavily utilized for this purpose and, to the extent that comparisons can be made across samples, trends in occupational aspirations could well be more intensively studied. Such studies might suggest possible areas for Federal

government intervention and (if they link aspirations to external data on the labor market, historical events, and the like) may suggest action stratagems.

The partial replication of TALENT conducted in 1970 (Flanagan, 1971, 1972) reveals, for example, that although high school students still tend to make "unrealistic" career choices, boys in 1970 had become slightly more realistic than their 1960 counterparts and girls slightly less. Flanagan attributes the latter result to the influence of a historical phenomenon, the women's liberation movement. He also reports a trend toward greater stress on psychological rewards and a substantial drop in the influence of traditional economic rewards (such as pay, promotion opportunities, and job security) on occupational choice. These changes may reflect widespread questioning of traditional values during the decade of the '60s, and could--if sustained--provide advance warning of basic shifts in national labor supply, potential labor-management bargaining objectives, and the like. Current data from the NLS-HS might be compared with older data to examine the durability of such trends.

To the extent that postsecondary education is viewed mainly as a vehicle to jobs, educational institutions must anticipate and respond to changes in the occupational aspirations of students. In conjunction with studies pertaining to shifts in occupational aspirations, users of NLS-HS (in particular) probably should examine carefully the dependence of school and major choice upon occupational aspirations. Such studies might be expected to yield information for forecasting what types of schools and academic programs may be over- or under-subscribed in the near future.

Perhaps of greater general use would be studies of the "lag" time between shifts in actual labor market conditions, shifts in occupational aspirations, and shifts in school or major choices. Such studies would require, of course, the supplementation of NLS-HS (or other survey) data by census or other externally obtained information on the labor force structure. If lag times are substantial, Federal intervention might be needed to speed recognition of changes in the labor force structure by high school students (and/or their counselors) and by schools. Such studies would have the objective of providing a basis for government action to make students' and schools' (secondary and postsecondary) planning more responsive to changes in the labor market.*

The history of education in America (see, for example, Jencks and Riesman, 1968) suggests that schools and curricula have responded rather slowly to long-term changes in the labor force structure; in times when changes are gradual--extending over a quarter of a century or more--and when it is easy to establish new schools or curricula, slow response to changing labor force structure may suffice. Under current conditions of more rapid change, intervention by the government may be required to assure that academic change keeps pace with structural change. The four surveys in question provide no data on changes in academic offerings, but their data on student plans and enrollments might be supplemented by data from HEGIS or other institutional surveys to conduct inquiries of

*The U.S. Dept. of Labor is experimenting with intervention of this sort. Under the Occupational Information Systems grant program, it has provided moderate financing (between $300,000-$450,000) to each of eight selected states. These grants are to be used for the purpose of developing a statewide system to collect, appraise, and--perhaps most important--disseminate career information that is current, accurate, and locally relevant.

the sort suggested.

A companion effort might utilize data from TALENT, NLS-LF, and NLS-HS to assess the relative success of different types of schools in placing graduates in the labor market. Data from these surveys might be used in conjunction with HEGIS or other institutional sources to examine the characteristics of especially successful schools (cf. Klitgaard and Hall, 1973).* Several efforts (e.g., Morgan and Duncan, forthcoming; Kohen, 1973; Link and Ratledge, 1975; Ribich and Murphy, 1975; Jencks and Rainwater, 1974) have used (or plan to use) proxy measures such as per-pupil expenditures or national prestige rankings to relate school quality to labor market experience. Use of HEGIS data to supplement the experience data provided by students in the four surveys would provide a wider array of postsecondary school characteristics with which to assess the relationship between schooling and work. It may be possible to focus on other descriptive attributes instead of, or in addition to, proxies for "quality." Combining institutional and student data would permit examination of interactions between student and school characteristics as influences on labor market experience. Such information might suggest strategies for intervention in the provision of

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*Merging data would require special arrangements with archive managers. Names of schools attended were obtained, but schools typically are not identified on data tapes.

information and/or the conditioning of financial aid to assure an efficient match between student, school, and curriculum, with efficiency defined in terms of expected employment benefits.

There are, then, a variety of possibilities for using data from the special longitudinal surveys, in conjunction with institutional data on postsecondary schools and labor force data, to investigate possible Federal intervention requirements and stratagems oriented toward improving the effectiveness of the postsecondary establishment in meeting students' needs for an employment payoff to their education.

From the standpoint of national needs (systemic requirements of the society), data on graduates' employment experience and academic majors might be analyzed in conjunction with labor force demand projections generated by the Bureau of Labor Statistics or independent sources such as academicians, the National Bureau of Economic Research, the Brookings Institution, and others. Such projections and student data might be combined with institutional data on staffing by discipline (available from independent sources such as the American Council on Education) to investigate how institutional staffing and student enrollment patterns relate to long-term labor demand projections. Among the more useful studies of this sort would be those for which the record is now complete with respect to both demand projections and student experience after graduation. TALENT data would be especially useful in this regard, in conjunction with labor demand projections made in the middle and late '50s

for the decade of the sixties. The objective of such studies would be to determine whether or not there are certain schools, or types of schools, which were particularly successful in anticipating and responding to shifts in labor demand. An examination of the characteristics of such schools might yield guidance on matters pertaining to institutional responsiveness to future demand for their graduates.

Much has been said about national needs for an informed and active citizenry. TALENT data on voting, newspaper reading, participation in Peace Corps and Vista, and various community activities (open ended item), obtained in the eleven-year follow-up for the 12th grade cohort, can provide some insights concerning these outcomes. They are by no means fully indicative of social participation and information, and the small rate of response (about 30 per cent of the 1960 cohort) makes the data of doubtful descriptive value. Nonetheless, for those who did respond it would be possible to link their educational experience and institutional characteristics to these indicators of citizen activity. As with the suggested occupational investigations, the objective would be to search for influences of school, student, and interaction between them, on citizen activity, so as to obtain suggestive evidence regarding what combinations yield the greatest contribution toward meeting the national need specified. NLS-HS data, if plans are realized, can contribute in a similar manner.

The usefulness of any such research for Federal policy on postsecondary education is, of course, limited by the ability and willingness

of the government to use its financial aid and technical assistance programs to encourage schools and students to meet national needs.* Although I take no position on the desirability of conditional aid, I do think it a matter which must be considered given scarce fiscal resources. A well-developed body of information about the characteristics of schools and students who are most effective in meeting national manpower and citizenship needs is a necessary prerequisite to any such consideration, hence I believe efforts to identify their characteristics would be a timely and worthwhile use of the available data.

Opponents as well as proponents of conditional aid will need information of the sort described if a debate commences. Information on efficient allocation of limited Federal funds is badly needed now. The four data bases under consideration, augmented by institutional and labor force data, can provide at least some preliminary assessments of relative contribution as well as suggestive information regarding intervention strategies to enhance the return to national investment in education.

Heretofore, most efforts to assess the return to educational

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*The prospect of this kind of government intervention (or, interference) has been a topic of controversy since the first debates about Federal aid to education began following World War II. Many citizens and schools would object strongly to efforts by the Federal (or any other) government to influence academic programs in keeping with conceptions and projections of national needs. Nevertheless (perhaps paradoxically), governments often share the blame for "failures" of the educational sector, such as inability of graduates to find jobs.

investment have concentrated on private returns, in the form of earnings and other employment benefits. That line of effort will doubtless continue in the foreseeable future. The focus on private benefits has not been accompanied by a strong body of research on public benefits, however, and it is that area which I believe to be both important and quite neglected.

Certainly, there are major problems of conceptualization and measurement facing any investigator who presumes to assess the public benefit from Federal policies (especially concerning financial aid) on education. Nonetheless, in an era of scarce tax resources and reports of diminished public faith in the efficacy of education, it seems essential that policy researchers turn their attention to assessing the public returns to public investment in education. It can be said that the public expects postsecondary education to provide special skills required for maintenance of the society and improvement of its "life-support" systems; the public also looks to postsecondary education, especially higher education, to produce a well-informed and publicly active citizenry. Researchers can and should use the data available in the several surveys to investigate (if not conclusively determine) the extent to which schools contribute to meeting these national needs, and to identify those characteristics of schools and students, singly or in interaction, which contribute most to satisfaction of these needs.

I recommend support for such a program of research, on grounds that Federal policy makers must be as concerned with the public contributions of education as they have been with the private.

SOME TECHNICAL FEATURES AFFECTING USE OF THE SURVEYS

This section highlights and offers assessments of some technical features and peculiarities of content which, I think, are most likely to affect use of the NLS-HS and its three alternates for policy research.* Greater detail about each survey, including citations of studies based on the data, can be obtained from the research organizations listed among the references.

NLS-HS

The National Longitudinal Survey of the High School Class of 1972 (NLS-HS) serves as the point of reference for this discussion. It is the most recent of the four surveys, initiated in the spring of 1972. The design of the NLS-HS called for a probability sample of approximately 20,000 students in some 1,200 high schools, both public and private, scattered throughout the 50 states and the District of Columbia. Individual students were sampled within schools.

Of the 1,200 primary sample schools selected, 251 did not participate in the 1972 survey; 21 had no seniors and 230 either refused to or (most commonly) could not participate because the request was

*It is not entirely clear what distinguishes policy research from other research, as noted earlier. For purposes of this discussion, I have focused on topics of continuing policy interest, namely participation in and consequences of postsecondary education. I have included, chiefly for illustration, some suggestions for research (such as studies of siblings) which might be done with the survey data. The inclusion of these suggestions does not imply that they are of high policy interest to the Office of Education.

received too late in the school year. To compensate for school nonresponse, participation was later secured from 204 of the 230 eligible but nonresponding schools and replacements were assigned for the 21 which had no seniors. For these schools, samples of 1972 seniors were drawn from school records and partial data were subsequently collected about their base year status. In addition to primary sample schools (those in the main base year sample and participating), data were collected from unneeded "backup" schools and their students in both the base year and first follow-up surveys, and from a few "augmentation sample" schools selected to compensate for incomplete listings of schools in the initial sampling frame. *

Because of the complexities of determining selection probabilities stemming from initial school nonresponse and subsequent resurvey work, and variations in response among students (some of whom answered both the base year and first follow-up surveys, some only the base year, and some only the first follow-up), six different sets of weights were derived for various classes of students and/or sets of variables. The survey contractor comments:

> The sample design involved 1,200 primary sample schools (two per final stratum) and 21,600 students (18 per school). However, the use of backup schools in the base year and first follow-up surveys, plus the resurvey work to obtain responses from all of the primary sample schools, resulted in three or four schools being represented in many final strata. After considering the alternatives, it was decided that all sample schools from which student questionnaires were completed, in either the base year or first follow-up survey, would be considered to be in the NLS sample. A total of 1,339 schools were classified as "in the final NLS

*The panel developed for the first follow-up, totalling some 22,000-plus former students from sampled schools, is continued in subsequent follow-ups. Except for additional weights (see footnote p. 55), the description of first-follow-up sampling applies thereafter.

> sample"--1,153 participating primary sample schools, 21 primary sample schools with no 1972 seniors, 131 back-up sample schools, 18 "extra" base-year schools in which student questionnaires were completed, and 16 augmentation sample schools. . . The release tape contains data for students representing 1,318 schools--all of the 1,339 schools in the final NLS sample except the 21 primary sample schools with no 1972 seniors.
> (Levinsohn, Riccobono, and Moore, 1975:6)

With respect to the number of student responses obtained from these schools, matters are almost equally complex. Levinsohn et al. (pp. 9-12 passim.) list five subsets of respondents, as follows:

> Table 4 shows the number of sample students in each of five response groups, determined by which questionnaires the students completed. From Table 4, one can see that 16,683 (response groups I and II) students completed the base-year Student Questionnaire. However, limited base-year data were also collected during the first follow-up survey from some additional sample students who had not completed the base-year Student Questionnaires. Thus, data for base-year items 2, 5, 8, 10, 16, 27, 83, 84, 88, 91, 92, 93, 94, and 95 (included on Form B, First Follow-Up Questionnaire) were obtained from 21,222 students (response groups I, II, and IV). Two sets of nonresponse adjusted student weights were computed for analyses of base-year data. Analyses of the 14 base-year items listed above should use the W2 weights. For all other base-year questionnaire items, the W1 weights should be used.

They go on to detail the numbers of students associated with the remaining four weights and the particular item sets to which the weights apply, but the reader is here spared these details. It should be clear that use of the NLS-HS data requires careful attention to the various weights and the responses which define them. In all, the five student response groups total 22,398, broken out as shown in Levinsohn et al., Table 4: 15,635 completed BY and FFU-Form A (which omits

items covered in the BY questionnaire); 1,048 completed BY only; 1,176 completed FFU-Form A only; 4,539 completed FFU-Form B (which includes 14 base-year items) only; and another 1,053 selected students completed none of the questionnaires. *

It should be evident that the size of the NLS-HS sample varies according to what questionnaires are under consideration. Besides this, as I have discussed elsewhere, item nonresponse in the first follow-up survey severely reduces the size, and quite likely the representativeness, of samples for particular variables. Schrader and Hilton (1975:47-63 passim.), in the context of assessing comparability of the NLS-HS and TALENT samples for purposes of potential trend analyses, remark on high item nonresponse for selected base-year items as potential sources of bias (e.g., educational aspirations missing 31.5 per cent; educational expectations missing 24.7 per cent; student's occupational preference missing 22.9 per cent; father's occupation missing 21.2 per cent; mother's occupation missing 18 per cent).

These problems with data quality and the complex weighting necessitated by school nonresponse and the efforts to compensate pose major difficulties to the would-be analyst of NLS-HS data. Although overall nonresponse has been low (in the range of 7 per cent), item nonresponse--particularly on items of critical importance like those noted by Schrader and Hilton--threatens representativeness of the sample and will require great caution to avoid inappropriate generalization.

*The foregoing applies to data collection through the first follow-up survey. A second follow-up was conducted in Fall, 1974, and a third follow-up began in Fall, 1976. For data through the second follow-up, there are 12 sets of weights and a wide array of sample sizes, depending on what combination of instruments was completed.

At present, two follow-up surveys have been completed (1973, 1974) and a third is in progress. Present plans call for further follow-ups at approximately two-year intervals into the early 1980s. Follow-ups have been conducted by mail, with telephone and some personal interviews to obtain critical missing data from respondents and to obtain responses from initial nonrespondents. Data tapes are presently available for the base year and both completed follow-ups.

The data content of NLS-HS was determined in part by the content of both TALENT and NLS-LF, which it follows. There is intentional overlap of coverage which should permit updating of estimates and elaboration of results obtained from the earlier bases (assuming success in coping with data quality problems). Both NLS-HS and the HEGIS institutional surveys are projects of the National Center for Education Statistics, consequently the NLS-HS survey contains information needed to link individual and institutional data.* Some suggestions for linking the two types of data have already been made. The NLS-HS has benefited from experience with "gaps" in the information provided by TALENT and NLS-LF, and items covering non-employment outcomes have been added. As noted, however, no attempt to match the detailed psychological data of TALENT was made, hence NLS-HS cannot be considered a replication of TALENT.

Comments on potential uses of NLS-HS data have been made throughout this paper in comparisons of other data bases with it, hence no added discussion is included here.

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*Not included on general release tapes. See footnote, p. 47.

NLS-LF

The National Longitudinal Surveys of Labor Market Experience, as the name suggests, focus mainly on employment and earnings. They offer a technically sound, though (for some uses) somewhat obsolescent, data base for inquiries concerning relationships between educational participation and subsequent labor force experience. Though NLS-LF lacks much of the educational detail of the NLS-HS, it provides greater detail on work experience.

What I refer to here as one study is actually two separate, though basically comparable, surveys, one of young men, one of young women, * conducted at different times. The "boys" survey was initiated in 1966, the "girls" in 1968. The initial sample of boys was 5,713, and base-year interviews were obtained for a bit over 91 per cent of these. The initial sample of girls was 5,533, with base-year interviews for some 93 per cent. I estimate that about 500 high-school seniors would have been included among the boys, about 550 among the girls. **

Differences between the "boys" and "girls" instruments induce some non-comparability between the data bases of the two cohorts. Whether or not the intended differences in content may have influenced other

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*Both have age ranges of 14 to 24.

**A member of the Ohio State University Center, who has worked extensively with the NLS-LF data base, concurs that these are reasonable estimates, per an informal telephone inquiry.

responses which were supposed to be comparable is a matter which would need investigation.

One potentially important difference between the "boys" and "girls" surveys is in the "knowledge of the world of work" measures. The occupations included (in lists of 10) in the scale for knowledge of primary work tasks differ, apparently to compensate for sex biases. It is not evident that the range of occupations covered is comparable. Within broad occupational levels, the males' list seems loaded toward more prestigious and higher-paid jobs than the females' list. Three occupations are common to both lists. The girls' survey omits a set of paired-comparison items covering estimated occupational earnings. The knowledge scales were administered in the first interview for boys, the second for girls.

Given no serious problems of comparability, it may be possible to merge portions of the two cohorts so as to yield a small, nationally representative sample of people who were high school seniors in 1968. I would expect about 500 boys, who would be in their second follow-up wave in 1968, and perhaps 550 girls in their first (1968) interview. Although not all items could be merged (owing to the difference in survey waves), major items regarding postsecondary education plans as of the senior year would be available for both.

This 1968 senior cohort was interviewed annually through 1971, thus allowing a trace of early postsecondary experience. Thereafter, data collection dates would not be comparable since the boys would have

concluded their participation in the basic survey in 1971, while the girls were only in their third follow-up wave as of that year. Additional data will be forthcoming from biennial telephone surveys instituted after 1971, but collection dates would not be expected to match. The possible confounding of time and sex is a problem with any proposed merger of the two NLS-LF youth cohorts. *

One feature of sample selection holds out the possibility of performing some analyses of the manner in which the activities of one family member impinge on those of another. For the NLS-LF, all age-eligible members of selected households were included in the sample(s). The sampling yielded over 20,000 people in four age-sex cohorts, ** from about 13,600 total households. This implies that up to half of the households yielded more than one sample member, many of which involved members of two or more cohorts. ***

Some proportion of NLS-LF high school seniors could be expected to have siblings in their own or the other youth cohort. Pairs of siblings might provide data to study, for example, the effect of the experience of older, employed siblings on the "knowledge of the world of work"

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*The "girls" cohort is about two years younger than the boys. Ages were as of Spring, 1966 for boys and January, 1968 for girls. Thus boys aged 14 at first interview had reached about 16 by the time the 14-year-old girls were first interviewed.

**"Boys" and "girls" were two, and "men" and "women" (older age groups) two more.

***According to survey documentation.

scores* for younger sample members.

Although the prospect of studying siblings as they progress through secondary school is enticing, I think the number of NLS-LF sample pairs is likely to be too small to permit reliable generalizations of relationships for the population. Detailed inquiries might generate hypotheses to be tested with other data sets or, since the NLS-LF samples were drawn at a time and in a manner similar to the PSID samples, it may be possible to use either as a testing ground for hypotheses developed from the other, where content overlaps. For example, 21 per cent of the NLS-LF male youths were married. One could thus expect about 1,000 such cases for whom complete data from 1966 onward would be available. Their experience might profitably be compared with that of about 280 male heads-of-household in the PSID who were of a comparable age (19 to 24) in 1968. **

Neither PSID nor NLS-LF has a great deal of detailed information about schooling, though NLS-LF has by far the more, and both are strong on employment and income data. NLS-LF might be a very good source of an independent sample of males aged 19-24 on which to test the kinds of hypotheses about education and work which could be generated by

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*The NLS-LF is unique among these studies in having such a measure.

**As of 1971, 84 per cent of the 1968 PSID families were still in the sample. Of these, 7.7 per cent of household heads were under 25 in 1968, and 90.9 per cent were males. This suggests about 280 male heads-of-household, in the age range of about 19 to 24 in 1968, for whom data covering 1968-72 would be available. Not all of this 280 would necessarily have been married.

PSID analyses.* Although the smaller PSID sample (for any age-sex cohort) would provide less precise estimates of population parameters, it seems likely that, as a practical matter, the two samples could be used as checks for each other.

NLS-LF data on 23- and 24-year-olds might also be usable in conjunction with TALENT's five-year follow-up on 1960 high school juniors.** Here, however, much more caution in comparing population estimates would be required because of the various technical flaws in TALENT, differences in stratification variables (which might be expected to influence the precision of estimates for particular parameters), and historical events--chiefly the marked expansion of U.S. involvement in Vietnam--which occurred during the time between data collection for the two studies (1965 for TALENT, 1966 and 1968 for NLS-LF).

On the whole, I think that comparisons between NLS-LF and TALENT data are less likely to be fruitful than those between NLS-LF and PSID. In turn, comparisons between NLS-LF and NLS-HS are likely to be much more informative than either of the others, because of content overlap.

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*If we extend consideration to older age cohorts, the same might be said for a greater portion of the data from each survey. NLS-LF has a cohort of about 5,000 men aged 45 to 59, who would be roughly matched by about 1,100 PSID household heads.

**Who would be about 23 years old in 1966, the NLS-LF "boys" base year.

TALENT

The Project TALENT base year (1960) data on high school seniors were obtained from over 81,000 individuals in randomly-chosen schools. Follow-up data were obtained from 51,500 (63 per cent) of these in 1961 and from 32,500 (40 per cent) in 1965. An eleven-year follow-up was done in 1971, with data obtained from 24,400 (30 per cent) of the 1960 seniors.

The sample is clearly large enough to satisfy most research needs, but it may suffer from not being representative. Yen and McLaughlin (1974:6) note that "nonwhites are greatly underrepresented in the TALENT follow-ups and that the follow-up sample is also biased toward upper levels of academic aptitude and socio-economic status. Results for nonwhites must, therefore, be taken as informative but not representative of all nonwhites." Of the nonwhite respondents, they say "the nonwhite sample displays unusually high academic aptitudes and SES." They further suggest that the 11-year data for all respondents can be generalized "only to those who were somewhat more able and socio-economically advantaged than their high school peers."

Since, owing to its age, the TALENT data base seems most useful for information pertaining to long-term consequences of academic participation, biases in the 11-year follow-up (though possibly correctable by weighting)* detract substantially from its use to assess the impact of

*Earlier efforts to compensate for nonresponse by weighting are complex, as described in Claudy (1972), and would be at least equally so for the eleven-year data. Moreover, the weights would be relatively large, especially for poorly-represented nonwhites.

schooling, especially for those groups about whom educational policy makers are particularly concerned.

In technical respects such as item sequencing and question-wording, the eleven-year questionnaire leaves something to be desired. Questions are complex, and fixed-choice response options sometimes offer more than one basis for choice of a single option or several options which are not mutually exclusive even though only one is to be chosen.* Such technical flaws impair interpretation of the details obtained, and sometimes would warrant collapsing of responses in such a way as to eliminate much or all of the detail sought. Apparently to satisfy specialized interests, "odd" questions having little relationship to the general focus on education and employment are included, one such being: (11) "In the last year have you been the driver in an auto accident in which someone was injured or there was property damage of $250 or more?", which is inserted between an item (10) on long-range employment plans and an item (12a) on the vocational orientation of the high school program.

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*Possibly the most contorted question is: (2b) "How far from the place you lived when you were in high school in the spring of 1960 do you now live?" An example of mixed bases of response is: (6g) "Do you plan to remain on this job for the next several years?: a. Yes, but only because I think it would be hard for me to find another job; b. Yes, I would like to; c. Probably; d. I can't decide; e. No, I would like to change jobs, but continue to do the same kind of work; (f. to k.)" Overlapping alternative responses are illustrated by: (12b) "When you got out of high school, did you get a job in that field? c. Yes, but I found I wasn't adequately prepared; e. Yes, but I found other experiences more helpful than my high school training."

Because of its data frailties, or other reasons, there has been rather limited use of the TALENT file during the 15 years since inception of the project. Claudy (1972) lists 110 uses of the data from 1964 through 1971, and an ERIC file search of literature through December 1975 lists 117 publications making some use of TALENT information.* The two lists, of course, overlap and neither may be exhaustive, yet they suggest that TALENT data have not been utilized nearly as much as might have been expected given the scope (and cost) of the surveys.

Despite its technical flaws, obsolescence, and limited use, TALENT is probably more useful than PSID as a source of data to supplement the NLS-HS. Used with caution, some TALENT data probably can be compared with NLS-HS data to assess changes in the relationship between high school and postsecondary experience over the decade of the sixties. Researchers with specific questions about change over the decade should probably examine TALENT and NLS-HS data files to locate sets of comparable items. I have doubts about the value of such comparisons, since the kinds of information available in both studies (and hence suitable for comparison) tend to duplicate information available from sources such

*My survey of ERIC documents contained in the library of the National Institute of Education indicates that many of these are redundant (e.g., papers read, then published in journals), are "promotions" of TALENT, or otherwise not instances of data analysis.

as CPS annual surveys of school enrollment and employment.*

From the stratification scheme and statements concerning sample bias for nonwhites in the follow-up surveys, I suspect that poor rural schools, and the students in them, were less well represented in TALENT than they were in NLS-HS.** There are differences in the stratification schemes used to sample schools for TALENT and NLS-HS (the latter more elaborate and probably more successful in avoiding biases). These differences in sampling render the unweighted base-year samples not entirely comparable, but the weighted data probably yield estimates for reasonably comparable universes of high school seniors in 1960 and 1972. Stratification for NLS-HS included controls for per cent minority, income class, degree of urbanization, and a special category for schools with high proportions of low income and/or minority

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*The two special surveys have some advantages over CPS. A detailed (item by item) comparison of data found in both TALENT and NLS-HS, but not available from CPS surveys, is beyond the scope of this review, but in general the special surveys provide vastly more information about details of high school experience than does the CPS annual survey on school enrollment. Both TALENT and NLS-HS provide base-year scores for mental ability not available in the CPS data, and it might be possible to use them to assess changes in the relation between mental ability and postsecondary education and employment.

**School response data in Schrader and Hilton (1975:28) show that about 93 per cent of invited schools participated. Any bias in representation would thus be attributable to the design and/or to student nonresponse rates. Schrader and Hilton compare TALENT and NLS-HS sampling in detail. Bowles (1969) remarks, regarding the TALENT 1965 senior follow-up, that blacks, lower-SES, and non-North students are underrepresented. Yen and McLaughlin (1974) make similar statements about bias in the 11-year follow-up. Both cite nonresponse as a major contribution.

students, which would suggest adequate representation of students in rural "backwater" schools and urban slum schools.

TALENT offers the only large sample of base-year seniors from which long-term education and employment data are available, via its eleven-year follow-up of the 1960 seniors. Likewise, it alone offers large samples of four successive single-year cohorts.* The availability of successive cohorts, each queried at the same post-high-school interval (one- and five-year follow-ups have been completed for all) makes TALENT an appealing data base for studies of the impact of short-run social change on relationships between base-year and later circumstances.

Whether the TALENT cohorts could be used to investigate short-run changes in such relationships is doubtful. Responses to questionnaires from 1960 9th-11th graders would not be comparable to those of 1960 seniors, owing to influences of maturation. To compensate for this, a special subsample of 1963 seniors (who were 1960 9th graders) was retested with the 1960 psychological batteries and an abridged form of the 1960 Student Information Blank, the attitudes-experience-plans questionnaire. However, no member of the 1963 subsample provided the full array of information

*Although both PSID and NLS-LF also offer successive-year cohorts and relatively long observation periods (now seven years for PSID, nine years for NLS-LF "boys," and seven years for NLS-LF "girls"), their cohorts are small and the amount of information about high school experience is limited. On the other hand (as will be discussed later), TALENT information about long-term employment activity is much less detailed than the NLS-LF, a factor which, coupled with its technical flaws, may make TALENT data less useful than the NLS-LF data.

obtained from the 1960 seniors, because each subsample member completed only half the original test battery (Claudy, 1972:15). Thus truly comparable data for the several single-year cohorts are lacking, despite the 1963 effort.

The one unequaled strength of TALENT, among the four surveys, is the array of data on individual psychological characteristics. Used with proper respect for its technical shortcomings, TALENT provides a capability for innumerable investigations of relationships between psychological characteristics and a large number of social attributes, including detailed information about the 1960 school attended. To what extent the results of such investigations might be time bound is--and, for the present, must remain--unknown. Only a substantial replication would allow estimates of the effects of changing social environment on validity of 1960-era findings for present-day students. *

Flanagan (1971, 1972) reports some descriptive results of a partial replication conducted in the spring of 1970. Eleventh-graders in a 20 per cent sample of the original TALENT schools were given selected portions of the base-year tests and questionnaire. Flanagan notes changes in the patterns of response, but effects of time on relationships between psychological characteristics and social attributes are not detailed. The

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*That is, insofar as we are concerned with postsecondary education policy. There certainly exists data obtained before and since 1960 which could be used to assess environmental influences on relationships among psychological traits and between these and some other variables, such as SES.

reported changes are small, but call attention to the problem of obsolescence in policy uses of TALENT.

My general assessment of the TALENT data does not recommend its use for policy-oriented analyses. While I think that for certain very specific purposes it may be useful, its age, technical flaws, and content put its major uses in the domain of basic, rather than applied, research.

PSID

The Panel Study of Income Dynamics was conceived as a study of the causes and consequences of changes in family socio-economic "well-being." Its primary unit of analysis is the family, though some data are available for every individual member of the base-year (1968) sample of 4,802 families. The focus on families, especially household heads, makes the data of this survey differ markedly from that obtained in the NLS-HS.

Data for more than 16,000 people were collected, including members of families in the base-year survey and some new spouses of original family members. Owing to new family formation, mostly resulting from departure of children from the original families, there were 5,207 families in the sample in 1972. Data were obtained for 5,060 (97.1 per cent) of these families.

Survey documentation indicates that despite high nonresponse rates in the first year (24 per cent across-the-board), and loss of about 11 per cent of the 1968 families at the first follow-up (in 1969), the sample as weighted to correct for such losses produced distributions on 1971

demographic characteristics in line with independent (CPS) estimates. Response rates for the years 1970 and following ran in the neighborhood of 97 to 98 per cent of the prior-year families, though in each year of the survey response rates for new families were substantially lower. For 1969 through 1972, the response rates for new families were 60 per cent, 84 per cent, 86 per cent, and 88 per cent, respectively. Coverage is less complete for new families than for the original ones, a matter which should concern policy analysts whose interests focus on just such newly-formed families. Except for 1969, the coverage of this group compares favorably to most surveys, hence the low response rate need not be considered a fatal flaw.

Loss of families from the original sample poses the greatest concern. The survey organization* was required to merge a sample of poor families interviewed in a special Census survey** with a newly-drawn representative sample of all U.S. families. The original PSID sample plan included 2,546 poor families, exclusive of some groups such as those with heads aged over 60 and residents of rural areas (non-SMSA's) outside the South. Of these 1,872 (74 per cent) provided data in 1968. Experience with the newly-drawn cross-sectional sample was about the same, with 2,930 of 3,643 eligible families (77 per cent) responding.

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*Institute for Social Research, University of Michigan.

**Survey of Economic Opportunity conducted in 1966 and 1967.

Response rates varied with characteristics of main sample families. Residents of the central cities of self-representing areas (i.e., the twelve largest metropolitan areas) responded at a rate of only 60 per cent, residents of large apartments (which would include both public housing projects and luxury high-rise) at 59 per cent, and the households least likely to have college-age children (those headed by people aged under 35 or over 74) at about 10 per cent higher than the overall rate. The survey organization says similar, though less pronounced, disparities occurred for the reinterview (poverty) sample.

As noted earlier, the Institute for Social Research was able to adjust the weights for various subclasses so as to correct statistically for variable nonresponse, as best can be determined by the estimates of national distributions for selected socio-economic characteristics. Nonetheless, one may be concerned about the representativeness of the sample with respect to social-psychological variables which determine decisions to participate. ISR explains the general nonresponse rates as largely owing to families having moved or disappeared as well as, possibly, to racial tensions existing in 1968.

My major reason for ranking PSID low among the four studies is paucity of data about college-age family members. I estimate that as of 1968 there were only some 200 to 250 high school seniors in the PSID sample, * with like numbers of seniors in years immediately following.

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*Estimate based on age distributions for youth still in the PSID sample as of 1975 and for NLS-HS seniors. PSID data are in Hill and Hill (1976: App. A). NLS-HS data from Levinsohn et al. (1975:App. J, p. 2). Thanks to Jonathan Lane for locating the PSID data.

Though such small numbers are usable for "causal" analyses, the precision of estimates of descriptive population parameters based on them is not likely to be high.

In my view, the PSID data base is too limited with respect to sample size and educational content to provide direct policy grounding. Nonetheless, for issues involving the relationship of changing family financial circumstances to children's participation in education, the PSID offers the most detailed accounting of family socio-economic conditions available in any of the four studies. If educational enrollment or attainment will suffice as the dependent variable, possible analyses involving go/no-go probabilities as a function of detailed family circumstances are manifold. *

Used for exploration and hypothesis generation, or specification of prior causal models, the PSID offers some unusual possibilities. One of the more interesting is studies of the variation in postsecondary education among siblings. Detailed accounts of family structure and change, including follow-on of departing members, are included. Most of the 1968 PSID families with any children under 18 had two or three children. Assuming an average spacing of two or three years, this might provide roughly as many younger siblings as 1968 seniors, or about 200

*Among other possibilities, the PSID includes a query to household heads concerning "taking courses or lessons." For years 1969-72, the type of course taken is available (categorized). These items offer possibilities for study of recurrent education, though much data would be retrospective.

sets of siblings* who reached college age during the course of study. A number of potentially useful inquiries might be done, centering on probabilities of college entrance as a function of child's sex, changes in family economic status, spacing of children, and the like. Such studies might serve to better specify known relationships between family SES and educational probabilities, and provide insights useful for guiding policy aimed at maximizing the educational opportunity impact of federal expenditures.

Another potential use of PSID data involves direct comparison with NLS-HS data. PSID data collection has been extended, on an annual basis, beyond 1972. There were, as of 1975, 325 people still in the sample who were 15 years old in the spring of 1968; 363 were 14 at that time. These cohorts would have reached an age comparable to the NLS-HS sample by the spring of 1972. Even though an expected 25 per cent of each age cohort would have dropped out of school after reaching age 16,** and some would never have been in high school for reasons of incompetence (e.g., retardation), one would expect about 250 youths each year to have moved through secondary school at about the same time as the NLS-HS sample. Their subsequent experience with postsecondary education and work may provide both an independent check on, or a basis

*Pairs or trios.

**The proportion of dropouts could be substantially higher, owing to oversampling of low-SES families.

for specifying, relationships drawn from the NLS-HS.

As suggested, there are conceivable uses for the PSID, but it is probably not a major source of information relevant to making Federal higher education policy.

SUMMARY APPRAISAL

Since most students and policy makers seem to agree that the main criterion for judging education is how well it serves as a vehicle for getting "good" jobs, I make my general assessment of these surveys in terms of their ability to answer questions relevant to that criterion. Since it may be argued that education ought to be assessed not only in terms of jobs, but also in terms of whether or not it generates an informed and active citizenry, it is also desirable to have information about the latter.

Each of these surveys contains enough information to answer questions about access to and persistence in postsecondary education. They differ, however, in the amount of detail and the kind of information available about antecedents of postsecondary experience and non-work experiences following completion of education. All contain at least some information about work experience.

NLS-HS

The NLS-HS ought to be the most useful of the four surveys for policy research on postsecondary education, but I think it is not. In terms of content, there is coverage of a wide array of social and socio-psychological antecedents, substantial information about the characteristics of schools, and very detailed and diverse information about educational, occupational, and "citizenship" outcomes.

There is a great deal of information relevant to assessment of high-school influences on entry into the world of work or college. In

the present socio-political context, that kind of information may have great policy "currency," considering its relevance to current concerns about an alleged "decline" in educational quality and utility.

However, as I have noted elsewhere, the survey suffers from technical flaws which weaken its potential. In addition to these flaws, the data now available cover only the first two years after high school, hence only short-run postsecondary experience can be examined.

My assessment of the NLS-HS is mixed. It is a very good source for a limited range of information. As additional follow-ups are completed, more (and more diverse) data will become available. If the technical flaws can be overcome, the NLS-HS data file could prove an excellent source of policy-relevant data. As of this writing, I see the NLS-HS as having important, but unrealized, potential. Whether it can be made to live up to its potential is a matter for both methodological and administrative debate. As matters stand at present, I view the NLS-HS as useful chiefly for investigating questions of access and short-run persistence, as these are influenced by details of the high school experience.

NLS-LF

Despite reservations based on its age and modest high school senior cohorts, I would rate the NLS-LF probably the most generally useful source of data among these four surveys. In terms of content and

technical adequacy, none of the data bases is better, even though some have features which are absent in the NLS-LF. The data base contains enough information about high school and college experiences, family, community environment, high school and college facilities, and occupational experience to permit fairly detailed analyses of the relationships among these several factors.

In part, the age of the data can be viewed as a plus, since the NLS-LF will soon* have available relatively long-term information (nine years for "boys," seven for "girls") and there are plans to complete at least ten years of information. The wide age range in both the male and female youth cohorts, coupled with the long run of the survey, will permit some examination of temporal influences on high school and later experience, since the youngest sample members (14-year-olds) will have graduated from high school in about 1970 (boys) and 1972 (girls). Given a constant mode of sampling and data collection, the data from the several single-year cohorts should be largely comparable and I would expect it to be possible to investigate the rate and "direction" of changes in plans, attitudes, expectations, and experience among cohorts during an especially volatile time period.

On the whole, I am fairly enthusiastic about the potential of this data base, although it lacks data on non-economic "outcomes" of education. The two-year lag in initiation date for the "boys" and "girls"

*Probably in 1977.

cohorts will pose some analytical problems, but these should not be insurmountable. Modest-to-small single-year cohorts (e.g., 18-year-olds only), coupled with the problems associated with merging data for males and females, will make use of the study for cross-sectional description troublesome, since sampling error will be large relative to what would have obtained with larger samples of each single-year cohort. However, the samples are not so small as to preclude causally-oriented analyses, with techniques more sophisticated than cross-tabulation. In sum, I think the virtues of the NLS-LF data file outweigh its deficiencies. If I were forced to choose only one of these four data bases, I would pick the NLS-LF as most generally useful.

TALENT

TALENT tends to ignore postsecondary education other than college, though the eleven-year follow-up attempts to get information about attendance and completion of technical-school and junior college programs. Through the first five years, the main "outcomes" measured are occupational, but the eleven-year follow-up contains some additional coverage of citizen participation, marriage and childbearing, geographic mobility, and a welter of other matters (including whether or not the respondent ever lived in a commune in the U.S.). Considering its age, its technical flaws, and what I see as superficial coverage of several important matters, I would rank TALENT low as a policy-research source.

PSID

I likewise rank PSID low, chiefly because of a paucity of education data. Even for heads of households (few of whom are in the focal cohort), * the amount of information about postsecondary education is sparse. For those who did not establish their own households, very minimal information about work is available. Thus, even though much information is available about families and their economic well-being, only the crudest relationships between education and other conditions could be established.

As noted, the number of people in the 1968-senior cohort would be quite small (about 200-250). If all sample members who were in any grade of high school in 1968 are considered, my estimate is that there would be about 1,000 sample members for whom it would be possible to determine whether they entered college, stayed in college, or went to work and kept working after leaving high school.

I downgrade the PSID with regret, because there is much detail about families of origin which might help specify the influence of families on access to higher education. Nonetheless, as a source of policy-relevant data, I feel the PSID has to be rated fairly low. The PSID is technically a good survey, but its purpose was not collection of information about postsecondary education. Its content, as a result, provides too little data about postsecondary education to make it very useful for policy research in that area. Examination and specification of detailed

*Those who were high school seniors at the beginning of the survey

family influences on access and persistence seem to be the most promising kinds of analysis of this data base.

Comment

I have stated that each source should be considered with regard to a very specific research question, rather than rated on some general basis. I reiterate that these general assessments and the remarks preceding them may mislead with respect to particular research questions.

Various limitations, with particular emphasis on the problem of obsolescence and other time-induced problems, * have been emphasized. These comments should not become a basis for precluding use of these data bases for research concerning postsecondary education policy. It would be a mistake to exclude any data source on the basis of general assessments.

*Such as the confounding of time and sex in the NLS-LF surveys.

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